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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,667	11/25/2003	Bosco P. Ho	7593-CO1	5949

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EXAMINER

FERNANDEZ, SUSAN EMILY

ART UNIT

PAPER NUMBER

1651

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/721,667	HO ET AL.
	Examiner Susan E. Fernandez	Art Unit 1651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-17 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-17 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) All    b) Some \* c) None of:
      1. Certified copies of the priority documents have been received.
      2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/25/03, 3/18/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

Claims 1-17 are pending and are presented for examination.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being obvious over Chatteraj et al. (US Pat. 6,329,165) in view of Ridgway et al. (Water Treatment Membrane Processes, McGraw Hill, 1996, pages 6.1-6.62).

The applied reference (the patent) has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by:

(1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention “by another”; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Chattoraj et al. discloses a method for monitoring planktonic and sessile microbiological populations (i.e. biofouling) in an industrial water system. Chattoraj et al. teaches the same method steps as claimed in the present application, using the same fluorogenic agents (see claims 1-15; column 2, lines 30-67; column 3, lines 1-54; column 4, lines 7-34; column 5, lines 6-31, 63-64; column 6, lines 42-45; and column 7, lines 64-67 of Chattoraj et al.). In regards to the amount of fluorogenic agent used, Chattoraj discloses that “an effective amount of fluorogenic dye is between about 0.005 ppm and about 1.0 ppm, preferably between about 0.02 ppm and about 0.5 ppm, most preferably between about 0.04 ppm and about 0.1 ppm, and the most highly preferable amount of fluorogenic dye is 0.05 ppm” (column 5, lines 41-46). These ranges clearly fall within the ranges as claimed in claims 8-10 of the instant application.

Chattoraj et al. does not expressly disclose that: 1) the method is usable on a reverse osmosis membrane separation system such as those claimed in the instant application, and 2) biocontrol agents or biocontrol methods can be used to control biofouling (Chattoraj et al. only teach the use of oxidizing and non-oxidizing biocides).

However, Ridgway et al. teaches that membrane separation processes such as reverse osmosis play essential roles in modern water treatment practice (page 6.1, lines 1-3). Additionally, membrane biofouling is a widespread problem in these treatment processes, especially in feedwater and industrial processes such as ground-water treatment, seawater desalination, and water production (i.e. in industrial water systems). See section 6.5 “Occurrence of membrane biofouling” on pages 6.20-6.21. Additionally, applicant has disclosed that membrane separation methods such as reverse osmosis is used in industrial processing of liquid streams, such as in water purification (page 1, lines 6-7 of the instant specification). Ridgway et al. also teaches that various options are available to control biofouling. Examples include the use of biocides, biocontrol agents (such as chelating agents, surfactants, and chaotropic agents), and biocontrol methods (such as ultrasound, electric fields, and air backwashes). See Table 6.4 on page 6.43.

Therefore, since reverse osmosis is commonly used in industrial water systems, as taught by Ridgway et al., it would have been obvious to use the method of Chattoraj et al. and apply it to reverse osmosis membrane separation systems. Although Chattoraj et al. only discloses the use of biocides as a means to control biofouling, it would have been obvious to modify that aspect of the method to include the use of other biocontrol agents and methods since these other

venues are also known and practiced in the art, as disclosed by Ridgway et al. A holding of obviousness is clearly required.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-5 and 9-17 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 6,329,165 B1 (Chattoraj et al., document AG of the present IDS) in view of Ridgway et al., 1996 (document

AP of the present IDS). Although conflicting claims are not identical, they are not patentably distinct from each other. Claims 1-5 and 9-17 of the instant application are directed to a method of monitoring biofouling in a membrane separation system comprising the steps of: a) adding a fluorogenic agent into the system; b) allowing the fluorogenic agent to react with microorganisms (e.g. planktonic microorganisms and sessile microorganisms) in the system to form a reacted fluorogenic agent; c) providing a fluorometer to measure fluorescence; d) measuring the fluorescent signals of the fluorogenic agent and the reacted fluorogenic agent; e) monitoring biofouling in the system by determining a ratio of the fluorescent signal of the reacted fluorogenic agent to the unreacted fluorogenic agent; and f) determining the rate of change of the fluorescence ratio. The method of the instant application is limited to membrane systems such as cross-flow or dead-end flow membrane systems, examples include reverse osmosis, nanofiltration, ultrafiltration, microfiltration, inter alia. Fluorogenic agents usable in the claimed method include resazurin, 4-methylumbelliferyl phosphate, pyranine phosphate, and others. The method also comprises steps for controlling biofouling by way of biocontrol treatments such as the use of biocides, biocontrol agents or biocontrol methods. Additionally, an inert fluorescent tracer can be included.

Chattoraj et al. (in claims 1-15) discloses a method for monitoring planktonic and sessile microbiological populations (i.e. biofouling) in an industrial water system comprising the steps of: a) adding a fluorogenic agent into the system; b) allowing the fluorogenic agent to react with any planktonic microorganisms and sessile microorganisms in the system to form a reacted fluorogenic agent; c) providing a means for measuring fluorescence (i.e. a fluorometer); d) measuring the fluorescent signals of the fluorogenic agent and the reacted fluorogenic agent and

calculating the ratio of the signals; e) monitoring biofouling in the system by determining a ratio of the fluorescent signal of the reacted fluorogenic agent to the unreacted fluorogenic agent; f) determining the rate of change of the fluorescence ratio; g) determining the optimal amount of biocide to add to the system based on the ratio or rate of ratio change; and h) delivering the optimal amount of biocide into the system. Fluorogenic dyes usable include resazurin, 4-methylumbelliferyl phosphate, and pyranine phosphate. Additionally, an inert fluorescent tracer can be included. Chattoraj et al. does not expressly disclose that: 1) the method is usable on membrane separation systems such as those claimed in the instant application, and 2) biocontrol agents or biocontrol methods can be used to control biofouling (Chattoraj et al. only teach the use of oxidizing and non-oxidizing biocides). However, Ridgway et al. teaches that membrane separation processes such as reverse osmosis, microfiltration, nanofiltration and ultrafiltration, play essential roles in modern water treatment practice (page 6.1, lines 1-3). Additionally, membrane biofouling is a widespread problem in these treatment processes, especially in feedwater and **industrial** processes such as **ground-water treatment**, seawater desalination, and **water production** (i.e. in industrial water systems). See section 6.5 “Occurrence of membrane biofouling” on pages 6.20-6.21. Ridgway et al. also teaches that various options are available to control biofouling. Examples include the use of biocides, biocontrol agents (such as chelating agents, surfactants, and chaotropic agents), and biocontrol methods (such as ultrasound, electric fields, and air backwashes). See Table 6.4 on page 6.43.

Therefore, since membrane separation systems are commonly used in industrial water systems, as taught by Ridgway et al., it would have been obvious to use the method of Chattoraj et al. and apply it to membrane separation systems. Although Chattoraj et al. only disclose the

Art Unit: 1651

use of biocides as a means to control biofouling, it would have been obvious to modify that aspect of the method to include the use of other biocontrol agents and methods since these other venues are also known and practiced in the art, as disclosed by Ridgway et al., *supra*.

Claims 1-17 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 6,699,684. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant application reads on a membrane separation method which is recited in '684 claims 3 and 4. Therefore, the claims under examination are properly considered obvious over the patented claims

Claims 1-17 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-13, 16, 18-20 of copending Application No. 10/740336. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant application reads on a membrane separation method which is recited in '336 claim 3. Furthermore, while '336 includes steps for the selection of a fluorogenic agent and an inert tracer, these selection steps would have been considered a matter of routine experimentation, as it would have been obvious to determine appropriate fluorogenic agents and tracers in order to optimize the monitoring of biofouling.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Art Unit: 1651

Therefore, the claims under examination are properly considered obvious over the '336 claims.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan E. Fernandez whose telephone number is (571) 272-3444. The examiner can normally be reached on Mon-Fri 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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